

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Attorney 15442US02

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In the Application of: Schoner)  
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U.S. Serial No.: 10/825,395 )  
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Filed: 4/15/2004 )  
)  
Examiner: Vo )  
)  
Group Art Unit: 2625 )  
)

APPEAL BRIEF

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

Sir:

This is an appeal from the Office Action made Final mailed December 31, 2008. A Notice of Appeal was filed with the United States Patent and Trademark Office on May 27, 2009.

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## **I. REAL PARTY IN INTEREST**

Broadcom Corporation, a corporation organized under the laws of the state of California and having a place of business at 5300 California Drive, Irvine California 92617, has acquired the entire right, title, and interest in and to the invention, the application, and any and all patents to be obtained therefore.

## **II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

## **III. STATUS OF THE CLAIMS**

Claims 1-27 are presently pending. Claims 28-35 are cancelled without prejudice.

Claims 1, 3-7, 10, 12-16, 19, and 21-25 were rejected under 35 U.S.C. 103(a) as being obvious from U.S. Patent 7,116,441 to Matsuoka ("Matsuoka").

Claims 2, 8, 9, 11, 17, 18, 20, 26, and 27 were indicated as allowable but objected to for dependency on a rejected base claim.

## **IV. STATUS OF AMENDMENTS**

The Final Office Action indicated that claims 2, 11, and 20 would be allowable if rewritten in independent form. In the response to final, Applicant submitted amendments to independent claims 1, 10, and 19, incorporating the subject matter of objected to claims 2, 11, and 20, respectively. Nevertheless, the amendments were refused entry.

The amendments are as follows:

1. (Currently Amended) A method that maps any input color from an image to an output color, the method using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the method comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color, wherein interpolating said mapping information for the nearest table entries comprises:

determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

2. (Cancelled)

8. (Currently Amended) The method according to claim 1 wherein the four nearest table entries are used to map the color of the input color.

9. (Currently Amended) The method according to claim 1 wherein two or one nearest table entries are used to map the color of the input color when the input color is near an edge of the look up table.

10. (Currently Amended) A system that maps any input color from an image to an output color, the system comprising:

a two-dimensional lookup table that contains mapping for a portion of the colors of the image; and

at least one processor capable of determining mapping information for table entries nearest to an input color, the at least one processor capable of interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color, wherein determining mapping information for the nearest table entries comprises:

determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

11. (Cancelled)

17. (Currently Amended) The system according to claim 10 ~~11~~ wherein the four nearest table entries are used to map the color of the input color.

18. (Currently Amended) The system according to claim 10 ~~11~~ wherein two or one nearest table entries are used to map the color of the input color when the input color is near an edge of the look up table.

19. (Currently Amended) A computer-readable medium having stored thereon, a computer program having at least one code section that maps any input color from an image to an output color using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the at least one code section being

executable by a computer for causing the computer to perform steps comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color; and

wherein the code for determining mapping information for the nearest table entries comprises:

code for determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

code for determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

code for determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

code for determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

20. (Cancelled)

26. (Currently Amended) The computer-readable medium according to claim 19 ~~20~~ wherein the four nearest table entries are used to map the color of the input color.

27. (Currently Amended) The computer-readable medium according to claim 19 ~~20~~ wherein two or one nearest table entries are used to map the color of the input color when the input color is near an edge of the look up table.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

Claim 1 is directed to a method that maps any input color from an image to an output color, the method using a two-dimensional lookup table (Figure 3) that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the method comprising:

determining mapping information for table entries nearest to an input color (Figure 2, LUT 203 "Lookup 4 nearest neighbors"); and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color (Figure 2, Interpolator 205, "4-way linear interpolation with bypass").

Claim 10 is directed to a system that maps any input color from an image to an output color, the system comprising:



a two-dimensional lookup table (Figure 3) that contains mapping for a portion of the colors of the image; and

at least one processor (Figure 4, 408) capable of determining mapping information for table entries nearest to an input color (LUT 203, "Lookup 4 nearest neighbors"), the at least one processor capable of interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color (interpolator 205, "4-way linear interpolation with bypass").

Claim 19 is directed to a computer-readable medium having stored thereon, a computer program having at least one code section that maps any input color from an image to an output color using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the at least one code section being executable by a computer for causing the computer to perform steps comprising:

determining mapping information for table entries nearest to an input color (LUT 203, "Lookup 4 nearest neighbors"); and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color (interpolator 205, "4-way linear interpolation with bypass").

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

Whether claims 1, 3-7, 10, 12-16, 19, and 21-25 are obvious under 35 U.S.C. 103(a) from Matsuoka.

## **VII. ARGUMENT: THE REJECTIONS TO CLAIMS 1, 10, AND 19 SHOULD BE REVERSED BECAUSE MATSUOKA DOES NOT TEACH "A TWO-DIMENSIONAL LOOKUP TABLE"**

Claim 1 is copied below:

A method that maps any input color from an image to an output color, the method using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the method comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

Claim 10 recites:

A system that maps any input color from an image to an output color, the system comprising:

a two-dimensional lookup table that contains mapping for a portion of the colors of the image; and

at least one processor capable of determining mapping information for table entries nearest to an input color, the at least one processor capable of interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

Claim 19 recites:

A computer-readable medium having stored thereon, a computer program having at least one code section that maps any input color from an image to an output color using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the at least one code section being executable by a computer for causing the computer to perform steps comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

Claim 1 recites, among other limitations, "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image".

Examiner has indicated that, Final Office Action, (FOA) December 31, 2008 at 2-3:

"Matsuoka discloses a method that maps any input color from an image to an output color, the method using a two-dimensional lookup table (e.g., the LUT generation unit 1209 generates an LUT for converting RGB data into CMYK data with reference to a mapped gamut as a mapping result of the gamut enlargement correction unit 1208, and writes it in the RAM 1202, column 23, lines 57-60; and the mapping gamuts is represented in two dimensional coordinate (e.g., two dimensional a\*b plane, figure 31). Thus, it is obvious that the LUTs (lookup tables) are two dimensional as well) that contains mapping for a portion of the colors of the image"

Examiner notes that "*it is obvious that the LUTs (lookup tables) are two dimensional*" which is different from saying the "*the LUTs are two dimensional*". Obviousness is a question of law based on underlying factual inquiries. The factual inquiries are as follows: (A) Determining the scope and content of the prior art; and (B) Ascertaining the difference between the claimed invention; and (C) Resolving the level of ordinary skill in the pertinent art. *Graham v. John Deere Co.*, 383 U.S. 1 (1966).

As an initial matter, it is unclear whether Examiner is arguing that Masuoka, (a) *expressly* teaches "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image", or (b) is inherent from the disclosure of Masuoka; or (c) is a difference from Masuoka, but that it would be obvious to one of ordinary skill in the art to modify Masuoka. Nevertheless, Assignee traverses all three arguments. Moreover, to the extent that Examiner is holding that the scope and content of the prior art can be other than express or inherent, Assignee respectfully traverses.

Masuoka does not expressly teach "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image". If, as Examiner has indicated, "Masuoka discloses the LUT generation unit 1209 generates an LUT for converting RGB data into CMYK data". It is noted that RGB data is three-dimensional. Even if "LUT generation unit 1209 generates an LUT for converting RGB data into CMYK data *with reference to* a mapped gamut as a mapping result of the gamut enlargement correction unit 1208" and that "*the mapping gamuts is represented in two dimensional coordinate (e.g., two dimensional a\*b\* plane,*

figure 31)", it does not follow that the LUT for converting RGB data into CMYK is "a two-dimensional lookup table that contains mapping for a portion of the colors of the image". Note that Figure 31 is not a lookup table. Thus, to the extent that Examiner holds that Masuoka expressly teaches "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image", Assignee traverses the rejection.

Additionally, Examiner has not provided any reasoning that "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image" is necessarily present in Masuoka. Accordingly, to the extent that Examiner is holding that "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image" is inherent from Masuoka, Assignee respectfully traverses.

Finally, Examiner has not provided any evidence "level of ordinary skill in the pertinent art" or that it include "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image". Accordingly, to the extent that Examiner holds that "using a two-dimensional lookup table that contains mapping for a portion of the colors of the image" is a difference from Masuoka, but that it would be obvious to one of ordinary skill in the art to modify Masuoka, Assignee traverses.

Regarding Claim 10, the Office Action states "Claim 10 is the system claim corresponding with method steps in claim 1 with operation corresponding directly to the steps in method of claim 1. Therefore claim 10 is rejected as set forth above for claim 1." Regarding claim 19, the Office Action states "Claim 19 is the system claim corresponding with method steps in claim 1 with operation corresponding

directly to the steps in method of claim 1. Therefore claim 19 is rejected as set forth above for claim 1."

**VIII. CLAIMS 3, 12, AND 21**

Claim 3 is copied below:

The method according to claim 1 wherein the mapping information of a table entry comprises color information associated with the table entry and a mapping condition associated with the table entry.

Claim 3 was rejected under 35 U.S.C. 103(a) as obvious from Matsuoka. Examiner has indicated that "Matsuoka discloses wherein the mapping information of a table entry comprises color information associated with the table entry and a mapping condition associated with the table entry (column 1, lines 9-14)." FOA at 4.

Appellant respectfully submits that Matsuoka does not teach the claimed "mapping condition associated with the table entry". Matsuoka, col. 1, lines 9-14 merely states:

The present invention relates to a signal processing apparatus, image processing apparatus, and their methods and, for example, to a signal processing apparatus, image processing apparatus, and their methods for converting or transforming (gamut-mapping) a signal in a given color space into that in another color space.

Appellant respectfully submits that the foregoing does not state any *condition*. Since claims 12 and 21 were rejected for the same reason as claim 3 (FOA at 5, 6), Appellant respectfully requests that the rejection of claims 3, 12, and 21 be REVERSED.

## **IX. CONCLUSION**

For the foregoing reasons, the appealed claims are distinguishable over the prior art of record. Reversal of the Examiner's rejection and issuance of a patent on the application are therefore requested.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Dated: October 27, 2009

Respectfully submitted,

/Mirut Dalal/

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## CLAIMS APPENDIX



1. A method that maps any input color from an image to an output color, the method using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the method comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

2. The method of claim 1, wherein interpolating said mapping information for the nearest table entries comprises:

determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

3. The method according to claim 1 wherein the mapping information of a table entry comprises color information associated with the table entry and a mapping condition associated with the table entry.

4. The method according to claim 3 wherein the mapping condition indicates whether the color information associated with the table entry is to be used when the mapping condition is asserted.

5. The method according to claim 4 wherein the mapping condition indicates whether the color information of the input color is to be used when the mapping condition is not asserted.

6. The method according to claim 5 wherein the color information of the input color is output without performing any mapping when the mapping condition is not asserted.

7. The method according to claim 6 wherein the brightness of the input color is mapped to an output brightness using brightness information of the table entries when the color information of the input color is output without performing any mapping.

8. The method according to claim 1 wherein the four nearest table entries are used to map the color of the input color.

9. The method according to claim 1 wherein two or one nearest table entries are used to map the color of the

input color when the input color is near an edge of the look up table.

10. A system that maps any input color from an image to an output color, the system comprising:

a two-dimensional lookup table that contains mapping for a portion of the colors of the image; and

at least one processor capable of determining mapping information for table entries nearest to an input color, the at least one processor capable of interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

11. The system of claim 10, wherein determining mapping information for the nearest table entries comprises:

determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

12. The system according to claim 10 wherein the mapping information of a table entry comprises color information associated with the table entry and a mapping condition associated with the table entry.

13. The system according to claim 12 wherein the mapping condition indicates the color information associated with the table entry is to be used when the mapping condition is asserted.

14. The system according to claim 13 wherein the mapping condition indicates the color information of the input color is to be used when the mapping condition is not asserted.

15. The system according to claim 14 wherein the color information of the input color is output without performing any mapping when the mapping condition is not asserted for all the nearest table entries.

16. The system according to claim 15 wherein the brightness of the input color is mapped to an output brightness when the color information of the input color is output without performing any mapping.

17. (Currently Amended) The system according to claim 10 wherein the four nearest table entries are used to map the color of the input color.

18. The system according to claim 10 wherein two or one nearest table entries are used to map the color of the input color when the input color is near an edge of the look up table.

19. A computer-readable medium having stored thereon, a computer program having at least one code section that maps any input color from an image to an output color using a two-dimensional lookup table that contains mapping for a portion of the colors of the image and using color information associated with an input color from the image, the at least one code section being executable by a computer for causing the computer to perform steps comprising:

determining mapping information for table entries nearest to an input color; and

interpolating the mapping information for the nearest table entries to obtain color information for an output color corresponding to the input color.

20. The computer-readable medium of claim 19, wherein the code for determining mapping information for the nearest table entries comprises:

code for determining mapping information of a first table entry corresponding to a color represented by the lookup table and closest to the input color;

code for determining mapping information of a second table entry a table entry away from the first table entry in a first direction in the lookup table;

code for determining mapping information of a third table entry a table entry away from the first table entry in a second direction in the lookup table;

code for determining mapping information of a fourth table entry a table entry away from the third table entry in a first direction in the lookup table; and

wherein the input color is located between the nearest table entries.

21. The computer-readable medium according to claim 19 wherein the mapping information of a table entry comprises color information associated with the table entry and a mapping condition associated with the table entry.

22. The computer-readable medium according to claim 21 wherein the mapping condition indicates the color information associated with the table entry is to be used when the mapping condition is asserted.

23. The computer-readable medium according to claim 22 wherein the mapping condition indicates the color information of the input color is to be used when the mapping condition is not asserted.

24. The computer-readable medium according to claim 23 wherein the color information of the input color is output without performing any mapping when the mapping condition is not asserted for all the nearest table entries.

25. The computer-readable medium according to claim 24 wherein the brightness of the input color is mapped to an output brightness using brightness information of the table entries when the color information of the input color is output without performing any mapping.

26. The computer-readable medium according to claim 19 wherein the four nearest table entries are used to map the color of the input color.

27. The computer-readable medium according to claim 19 wherein two or one nearest table entries are used to map the color of the input color when the input color is near an edge of the look up table.

28-35. (Cancelled).

## EVIDENCE APPENDIX

There are no pages in this appendix



## RELATED PROCEEDINGS APPENDIX

There are no pages in this Appendix.